

**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE**

SHOPIFY INC. AND SHOPIFY (USA),  
INC.,

Plaintiffs and Counterclaim  
Defendants,

v.

EXPRESS MOBILE, INC.,

Defendant and  
Counterclaim Plaintiff.

Case No. 19-439-RGA

**PLAINTIFFS AND COUNTERCLAIM DEFENDANTS  
SHOPIFY INC. AND SHOPIFY (USA), INC.'S PROFFER OF FACTUAL TESTIMONY  
TO BE PROVIDED BY PRIOR ARTIST, DR. MICHAEL ARNER**

Pursuant to the instructions provided by the Court during the status conference on January 28, 2022, Express Mobile deposed Dr. Michael Arner for the second time on March 22, 2022. Further to the Court's direction, Plaintiffs Shopify Inc. and Shopify (USA), Inc. ("Shopify") hereby proffer the following summary of factual testimony of Dr. Michael Arner that Shopify intends to offer at trial. Shopify is informed and believes that if Dr. Arner is called as a witness at trial, Dr. Arner will testify consistent with the facts below, based on his personal knowledge.

This testimony is relevant and admissible, because it will provide additional context to the jury about the prior art and problems that Dr. Arner was trying to solve. This is particularly true here, where Express Mobile intends to provide testimony from two named inventors of the Asserted Patents<sup>1</sup> about the work they did, as is reflected in the Patents-in-Suit.<sup>2</sup> Courts have routinely held that factual testimony from prior art inventors is relevant and admissible, because it provides the jury with additional context to consider as part of its determination of whether the asserted claims of the Asserted Patents are obvious.<sup>3</sup>

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<sup>1</sup> U.S. Patent No. 9,063,755; U.S. Patent No. 9,471,287; U.S. Patent No. 9,928,044.

<sup>2</sup> Express Mobile has stated that it intends to offer testimony from named inventor Mr. Steven Rempell as to "Knowledge of Express Mobile business operations and patent licensing practices; conception and reduction to practice of asserted patents; prosecution of asserted patents in USPTO; prior art." Express Mobile's First Suppl. Initial Disclosures, at 2 (May 4, 2021). Express Mobile has stated that it also intends to offer testimony from named inventor Mr. Ken Brown on "Technology, conception, and reduction to practice of the '755, '287, and '044 Patents." *Id.* Shopify maintains that Dr. Arner's factual testimony about his prior art patent application is relevant to the jury for at least the same reasons as Mr. Rempell and Mr. Brown's factual testimony about the Asserted Patents.

<sup>3</sup> *See Knowles Elec., LLC v. Microtronic U.S., Inc.*, No. 99 C 4681, 2000 WL 310305, \*2 (N.D. Ill. Mar. 24, 2000) ("an inventor's testimony concerning the design and mechanics of his particular contribution to the prior art may indeed aid the factfinder in determining the scope and meaning of the prior art"); *Verizon Servs. Corp. v. Cox Fibernet Virginia, Inc.*, 602 F.3d 1325, 1339-40 (Fed. Cir. 2010) (affirming district court's decision to allow prior art inventor testimony based on personal knowledge); *CertusView Techs., LLC v. S&N Locating Servs., LLC*, No. 2:13cv346, 2016 WL 6915303, at \*1 (E.D. Va., Mar. 7, 2016) (holding that prior art inventor

## I. INTRODUCTION

1. Dr. Arner is the first named inventor of U.S. Patent Publication No. 2009/0013310 (the “’310 application”) (DTX024 & DTX025), which expressly incorporates the entirety of provisional application 60/969,428 (the “’428 application”) (DTX022 & DTX023) by reference (together, the “Arner” reference). Shopify contends that Arner renders the asserted claims of the ’755, ’287, and ’044 patents obvious. Dr. Arner will testify that he was involved in the drafting of Arner and will provide the jury with context about Arner, including the research and development work that is reflected in the disclosures of Arner, as well as what motivated this work. Additionally, Dr. Arner will explain the key features described in Arner for mobile application development and explain what motivated the development of these features. He will also explain what he intended to convey about his development work and the functionality described in Arner.

2. Dr. Arner’s testimony will be helpful to the jury in understanding what challenges existed at the relevant time and his solutions to these problems, which will provide the jury with

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could testify as a lay witness based on his personal knowledge); *Fresenius Med. Care Holdings, Inc. v. Baxter Int’l, Inc.*, No. C 03-1431 SBA, 2006 WL 1330002, at \*3 (N.D. Cal. May 15, 2006) (same); *Gart v. Logitech, Inc.*, 254 F. Supp. 2d 1119, 1123 (C.D. Cal. 2003) (same). *Cf. also In re Google LLC*, No. 2021-170, 2021 WL 4427899, at \*7 (Fed. Cir. Sept. 27, 2021) (rejecting the notion that prior art witnesses are irrelevant in the transfer analysis because they are allegedly unlikely to testify at trial); *In re Hulu, LLC*, No. 2021-142, 2021 WL 3278194, at \*3 (Fed. Cir. Aug. 2, 2021) (same); *Innogenetics, NV*, 512 F.3d 1363 (Fed. Cir. 2008) (“Abbott also argues that there is no requirement that an expert opine on motivation to combine references, and that motivation can be established by other witnesses or the prior art. Abbott is correct that an expert is not the only source for evidence that it would be obvious for one skilled in the art to combine references to reach the claimed method.”); *Voice Techs. Group, Inc. v. VMC Systems, Inc.*, 164 F.3d 605, 615 (Fed. Cir. 1999) (in discussing patent-in-suit inventor testimony in the context of *Markman* “An inventor is a competent witness to explain the invention and what was intended to be conveyed by the specification and covered by the claims. The testimony of the inventor may also provide background information, including explanation of the problems that existed at the time the invention was made and the inventor’s solution to these problems.”).

additional context to consider and compare with expected analogous testimony from at least two of the named inventors on the Asserted Patents.

## **II. DR. ARNER'S BACKGROUND<sup>4</sup>**

3. Dr. Arner will identify himself as the first named inventor on the '310 application, which expressly incorporates the '428 application in its entirety by reference.

4. Dr. Arner will testify that he is a co-founder of Roam Data, Inc. the assignee of the '428 and '310 applications. Dr. Arner will testify that Roam Data was founded in 2005, and that he submitted the '428 application on August 31, 2007. Dr. Arner will testify that he submitted the '310 application on August 27, 2008. Dr. Arner will testify that the '310 application incorporates all the content of the '428 application by reference.

5. Dr. Arner will testify that he developed a product (the "RoamData Suite of Development Tools") while at Roam Data, and the functionality and technical details of that product as it existed as of August 31, 2007 are included within the '428 and '310 patent applications, respectively, including Appendix A filed as part of the '428 application, which is titled RoamData "Integrated Development Environment User Manual."

6. Dr. Arner will testify that by August 31, 2007, he was well-versed in HTML, JavaScript, and CSS and was familiar with server-side scripting and developing programs using languages such as Java, C++, or Visual basic. He will explain he has an undergraduate degree in Computer Science/Mathematics. He will also state that by August 31, 2007, he had knowledge of, and experience with, software development and web design and development with graphical user interfaces and systems.

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<sup>4</sup> Headings are provided for organizational purposes only. They are not part of Dr. Arner's proposed testimony.

**III. DR. ARNER'S PROPOSED TESTIMONY ABOUT THE AUTHENTICITY OF ARNER**

7. Dr. Arner will testify that '428 application (designated DTX022) is an authentic copy of the '428 application, in light of Express Mobile's objections to this document as unauthentic. *See* D.I. 324-08 at entry for DTX022. Dr. Arner will also confirm that he has knowledge of the '428 application as presented at trial, and that the '428 application is the application incorporated by reference into the '310 application, in light of Express Mobile's objection to the '428 application as lacking foundation. *Id.* Dr. Arner will also confirm that the '428 application is complete, in light of Express Mobile's objection to the '428 application as incomplete. *Id.* Dr. Arner will provide similar testimony with respect to the '310 application, to the extent Express Mobile makes any similar objections to this application.

8. Dr. Arner will testify that he has personal knowledge of the '428 and '310 applications, that he is familiar with them and the records of the Patent Office as they relate to the '428 and '310 applications, that he recognizes the '428 and '310 applications as presented at trial as true and authentic copies of those applications, and that the '428 and '310 applications are complete copies of those applications.

9. Dr. Arner will testify that he personally wrote, or assisted in writing, much of Arner, including the user manual that is included as Appendix A to the '428 application. Dr. Arner will testify that Appendix B to the '428 application is exemplary XML code for an application created using the disclosures of Arner.

**IV. DR. ARNER'S TESTIMONY AS TO PROBLEMS HE WAS TRYING TO ADDRESS AND HIS MOTIVATIONS**

10. Dr. Arner will testify about the problems he faced and considered as part of the conception of Arner in approximately 2005-2007, and the solutions he developed to address

them, which are reflected in the disclosures of Arner.<sup>5</sup>

11. Dr. Arner will testify as to what he intended to be conveyed in Arner. Dr. Arner will testify as to the motivations behind functionality and tools described in Arner the way he did.

12. Dr. Arner will testify that the disclosures of Arner relate to an integrated development environment (IDE), which is a software tool that allows a user to author and develop Rich Internet Applications (“RIAs” or “applications”). Dr. Arner will testify that the Arner reference uses the term “Rich Internet Applications” to refer to applications that interacted with the Internet and were designed to replicate the more robust user experience of desktop applications.

13. Dr. Arner will testify that one of the goals in developing Arner was to allow for creation of RIAs that are designed to run across a variety of remote computing devices, such as mobile phones.

14. Dr. Arner will testify that another goal of the research and development work reflected in the disclosures of Arner was to enable convenient, simple development of secure, effective business applications for use on mobile devices whose limited native processing power might otherwise make such rich functionality impossible.

**A. The Target Audience for the Application Development Tools Described and Claimed in Arner**

15. Dr. Arner will testify that the intended users of the tools and methods described in Arner included skilled software developers, but also include persons with little or no

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<sup>5</sup> Throughout, Dr. Arner’s testimony will be based on the disclosures of Arner, and he will explain the problems he faced, his motivations for the solutions he pursued, as well as his goals for the disclosures set forth in Arner.

programming experience. Dr. Arner will testify that one of the goals of the functionality reflected in the disclosures of Arner was to make application development easier and more accessible to laypersons.

16. Dr. Arner will further testify that one of his goals was to make it possible for users to develop and deploy mobile applications without needing to write any code themselves. Dr. Arner will testify that this was a goal, because historically, from his perspective, development of mobile applications required a highly-skilled programmer, which increased the burden associated with developing new mobile applications.

17. Dr. Arner will testify that he considered the mobile environment more challenging to develop applications than the desktop environment, because the mobile environment was less mature. Dr. Arner will testify that in his personal experience, fewer developers were familiar with the specific operating systems and coding languages for mobile phones at the time of his development work, compared to the number of developers with knowledge of this information with respect to desktop applications.

18. Dr. Arner will testify that by the time of his development of Arner, he did not consider it difficult to develop desktop applications. Dr. Arner will testify that functionality described in Arner reflects his attempts to minimize and reduce the increased challenges associated with mobile application development compared to desktop application development.

19. Dr. Arner will testify that security concerns for internet-based mobile applications also motivated certain aspects of the disclosures in Arner he developed, but it was only one of the concerns that was motivating the development of the functionality described in Arner.

20. Dr. Arner will testify that the disclosures in Arner describe functionality and tools for the creation and development of mobile applications that: (1) are built using an integrated

development environment (IDE) that simplifies development work; (2) include integrated web services functionality; (3) are designed to be run on any device, provided the user of the device has installed the appropriate application player for his or her device with the correct application player; (4) include security features that use an intermediary server to mediate and approve connections with the integrated web services, (5) are designed to communicate with remote third-party web services or with web services located on the intermediary server, and (6) could easily be adapted to run in a web browser.

21. Dr. Arner will testify that some of the possible mobile applications he envisioned could be built with using the tools described in Arner included applications with web service functionality for processing credit card payments and implementing shopping carts.

**B. Arner's Integrated Development Environment**

22. Dr. Arner will testify that the tools disclosed in Arner were designed with the goal of making mobile application development for different mobile device platforms easier. Dr. Arner will testify one of these tools was an integrated development environment (“IDE”)—i.e., the software interface used to author and develop applications.

23. Dr. Arner will testify that the IDE described in Arner reduced the skill level necessary to develop mobile applications, and allowed non-software developers to develop mobile applications, because it provided for drag-and-drop functionality without the need to write code.

24. Dr. Arner will testify that a tool included in the IDE in Arner, called the “WSDL Integrator,”<sup>6</sup> allows the user to add web service functionality into the application being designed.

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<sup>6</sup> WSDL stands for “Web Services Description Language,” which is a standard that defines web services. A WSDL file defines a specific web service.



Dr. Arner will testify that the WSDL integrator reads the WSDL file defining a web service and then presents the expected parameters in a table to the user of the IDE, which can be used to generate the user interface around the web services functionality.

25. Dr. Arner will testify that the benefit of the WSDL integrator disclosed in Arner is that it allows a user to easily integrate web services functionality into the application they are developing. Dr. Arner will testify that the WSDL integrator disclosed in Arner allows the user to either manually associate graphical components to be displayed with the expected web service parameters by dragging-and-dropping, or to have the WSDL integrator automatically create the graphical components for use with the parameters.

26. Dr. Arner will testify that the functionality and tools described in Arner were designed to provide both options, to allow users to choose how much customization was desired. Additionally, Dr. Arner will testify that his goal in designing the IDE was to simplify the process of integrating web services into an application, even for persons with little software development experience.

27. Dr. Arner will testify that an example integration of a web service into an application is discussed in Arner. Dr. Arner will testify that the tools described in Arner were not limited to this exemplary implementation, however, and were designed to allow for integration of any WSDL-based web service into a mobile application.

28. Dr. Arner will testify that the WSDL integrator provided this functionality by examining WSDL files, computing the functions and parameters described in those files, and displaying this information in a table for the user to implement as part of their application development.

29. Dr. Arner will further testify that this information is used by the WSDL integrator

and IDE described in Arner to create graphical components around the web service functionality, which an end-user of the application would interact with to access the web service.

30. Dr. Arner will testify by reference to the example application found in Appendix B of the '428 application that applications created using the disclosures in Arner include code that links the user interface to the actual request and response sent to the web service, and it does that by using the names of the functions and parameters found in the WSDL file and associating them with the graphical components that form the user interface.

31. Dr. Arner will testify that the IDE described in Arner allows developers to add graphical components easily and efficiently to an application. Dr. Arner will testify that there were several different graphical components in Arner that could be added, depending on desired use.

32. Dr. Arner will testify that a user of the IDE described in Arner could manually associate available graphical components with a web service input or output. Alternatively, graphical components could be automatically created by the WSDL integrator, based on the analysis of the WSDL file defining the web service. Dr. Arner will testify that these features were included in tools described in Arner to help fulfill the goal of creating a tool that would allow users of the IDE to quickly and easily build applications that included web service functionality.

33. Dr. Arner will testify that the tools could also be used to provide additional functionality described in Arner, referred to as “extended components.” Dr. Arner will testify that these extended components are bundled software that includes all the code necessary to interact with a web service bound to specific graphical components.

34. Dr. Arner will testify that one such “extended component” in Arner is a credit

card widget, which a user could select to add credit-card payment processing quickly and easily to their application. Dr. Arner will testify that these extended components were pre-defined within the IDE and could be selected by the user during the application development process. Dr. Arner will testify that this functionality also furthered his goal of creating tools that simplified the process of developing mobile applications that included web service functionality.

35. Dr. Arner will testify that the IDE described in Arner allowed a developer to register an application in an application database and publish that application, which means that the application is made available on a server and can be downloaded onto an authorized user's mobile device.

36. Dr. Arner will testify that the application in Arner could be generated automatically by the IDE based on selections made by the user, which furthered his goal of simplifying the mobile application development process and minimizing, or even eliminating, the need for users to write code directly for their applications.

### **C. Platform Independent Applications**

37. Dr. Arner will testify that he was aware of three types of applications for interfacing with web services when he was developing Arner: 1) desktop applications; 2) web-based applications; and 3) smart client applications. Dr. Arner will testify that each of these types of applications had features and drawbacks and that one of his goals was to provide applications that combined the best features of these individual types of applications, without the same drawbacks.

38. Dr. Arner will testify that by August 31, 2007, there were many different mobile devices that used different operating systems such as Windows CE, Palm, and different versions of J2ME. Dr. Arner will testify that he considered different known solutions for mobile application development, but these solutions (which include solutions using J2ME, .NET, AJAX,

asynchronous JavaScript and XML, FLEX, Flash Lite, LAZSLO, and WAP browsers), did not fully address the problems he was trying to solve or the goals he was trying to achieve.

39. Dr. Arner will testify that some of the problems left unaddressed by these known solutions included: being too “heavy” for cell phone application development; difficulty in programming; multiple requirements for custom solutions on the device, server, and network; insufficient security controls; lack of compliance with web service standards; limited offline capabilities; significant bandwidth demands; and limited access to device resources. Dr. Arner will testify that the disclosures of Arner address and overcome the limitations of these known solutions.

40. Dr. Arner will testify that as of August 31, 2007, mobile remote devices included mobile phones, personal digital assistants (PDAs), point of sale devices, tablets, pagers, and laptop computers, among others. Dr. Arner will testify that many of these devices were underpowered, often not connected to the internet, had limited bandwidth, had limited storage, had limited processing capacity, were susceptible to loss or theft, had varying capabilities, and ran on varying platforms and operating systems. Dr. Arner will testify that recognition of the limitations of mobile devices and a desire to overcome them were key motivations in the design and development of the disclosures of Arner.

41. Dr. Arner will testify that because Arner describes using a server to perform much of the processing of web services functionality, little processing burden is put on the client-side mobile device.

42. Dr. Arner will also testify that prior to August 31, 2007, there were many types of mobile devices running different operating systems with different supported features. Dr. Arner will testify that as he was developing Arner, he considered the fact that if a developer wanted to

write an application for all of them, the developer would need to be familiar with the different platforms, understand how they each operate, and write different sets of application code for each device platform.

43. Dr. Arner will testify that the tools and techniques he developed and described in Arner reduce this development burden by allowing a developer to create a single application, which will work on the full range of supported device platforms. This reduces the skill and time necessary to develop applications for use across a broad range of mobile devices and minimizes the efforts required to maintain and update the application code if additional functionality is later desired. Dr. Arner will testify that one of his goals was to ensure that an application could be deployed on a variety of mobile devices and desktop computers with minimal effort.

44. Dr. Arner will testify that the IDE tool described in Arner provides the developer with four different views to help the developer see and customize various aspects of the application. Dr. Arner will testify that he designed the IDE to provide different views because his goal was to provide additional flexibility with respect to the skill set of the developer, but that not every view needed to be used to develop every application.

45. Dr. Arner will testify that by August 31, 2007, many mobile devices used Wireless Access Protocol (“WAP”) browsers to access the internet. Dr. Arner will testify that he believed mobile applications implemented using WAP browsers had some limitations, which the disclosures of Arner are designed to address and overcome.

46. Dr. Arner will further testify that he considered it challenging to make applications for phones with appealing layouts and designs, because of the phones’ limited screen sizes. Dr. Arner will testify that the functionality and tools described in Arner were designed to allow developers to build applications for mobile devices and for devices with larger

screens. Dr. Arner will testify that the functionality and tools described in Arner were also designed to address the problem of operating system divergence, both between mobile and desktop devices, and among the various types of mobile devices.

47. Dr. Arner will testify that his goal was to design tools that could be used to make a single application for a variety of devices with limited memory and varied supported features. Dr. Arner will testify that the functionality and tools described in Arner can be used to create a single application for all devices, but that when the application is sent to a specific device, any code that is not needed by a particular device is stripped out, to minimize bandwidth requirements for sending the application and storage requirements for storing the application, in view of the limited bandwidth and memory of mobile devices at the time.

48. Dr. Arner will testify that in Arner, the application is an XML file, although that is an exemplary format. Dr. Arner will testify that XML met his goal of providing a platform-independent application, which was important because it meant that one application could be developed that would run on a variety of different mobile device platforms (provided the mobile devices included the correct application player). Dr. Arner will testify that the goal of his disclosures in Arner was to create a single application that was independent of device platform, but which could be optimized to specific platforms based on supported features.

49. Dr. Arner will further testify that the application could include within the XML file, script as well. Dr. Arner will testify that completed XML applications were stored in a database on the server.

**D. Platform Dependent Players**

50. Dr. Arner will testify that in Arner, to run an application the user's device must have a separate application player that is specific to the device's platform. Only application players authorized to run a given application are permitted to access the application on the server

and download it to the device. Dr. Arner will testify that this design helped increase security by only allowing authorized application players access to applications they were permitted to access.

51. Dr. Arner will testify that in Arner, there are different versions of the application player for different operating systems. Dr. Arner will testify that the motivation behind this design was to easily develop rich internet applications that could be used with a variety of devices with different platforms, i.e. the device player worries about the device's platform so the application can remain platform independent. Dr. Arner will testify that the use of an application player rather than attempting to run applications directly on the client device provided platform independence for the application, enabled functionality even when offline, and abbreviated the length of the application certification process.

52. Dr. Arner will testify that Arner does not limit the device platforms for which players might be developed. Dr. Arner will testify that one of the described embodiments of the application player is an application player written in C, which is executed directly by the operating system such as Windows CE. Dr. Arner will testify that another described embodiment used an application player written in C# that was executed by a managed code environment such as Compact.NET.

53. Dr. Arner will testify that in Arner, one of the tools used in development of the applications was a "Win32" client that allowed developers to test the functionality of any created application on a desktop, before making the application publicly available. Dr. Arner will testify that this testing functionality was intended to facilitate quality checks and further development without needing to release the application to a target device.

54. Dr. Arner will testify that the application player encapsulates platform-dependent

functionality that would otherwise have needed to be part of a natively running application. Dr. Arner will testify that the application player is responsible for interfacing with device drivers, accessing peripheral devices, requesting functionality from the server through XML messages embedded in SOAP requests, and interpreting any XML messages it receives embedded in SOAP responses from the server. Dr. Arner will testify that this design was intended to help meet the goals of increased security, enabling offline access, and providing platform-independence for the applications.

55. Dr. Arner will testify that one of the benefits having an application player that executes an application (rather than an application that is executed directly by the device processor) is that it allows for smaller applications and lower bandwidth requirements. More specifically, Dr. Arner will testify that the applications developed using the disclosures of Arner are at least six times smaller than a typical browser application and the network traffic generated by a web service call is approximately twenty times smaller than that of a typical web service call via web interfaces. This helped meet his goal of reducing computing burdens on the mobile device.

**E. Secure Communication with Web Services**

56. Dr. Arner will testify that one of his goals was to create applications for mobile devices that provided enhanced security since mobile devices are inherently less controlled than a desktop environment.

57. Dr. Arner will testify that in his experience, if a company wanted to create a program for a mobile device that processed payments and that ran natively on a device, the device manufacturer would need to certify it. Dr. Arner will testify that he considered it challenging to certify applications that included financial components, e.g. for processing payment, with device manufacturers.



58. Dr. Arner will testify that one of his objectives in developing Arner was to isolate the payment processing parts of the application so that it could be certified separately from other parts of the application. Dr. Arner will testify that her referred to this in Arner as the “application player.”

59. Dr. Arner will testify that the functionality and tools described in Arner allow for the development of applications that include and interact with remote web service functionality via the user’s mobile device. Dr. Arner will testify that the use of an intermediary server was decided upon to provide better security than if the device communicated directly with the third-party web services. Dr. Arner will testify that the single intermediary provides web service security, web service access control, device access control and authentication, link security, auditing, and granularity of access control.

60. Dr. Arner will testify that web services can be hosted by third parties on their own servers, but that the intermediary server itself is a web service too and directly communicates with the application player on the user’s device. Dr. Arner will testify that the functionality of this intermediary server includes receiving parameters from a device and either processing those parameters on the intermediary server web service (e.g., if the application player requests available RIAs), or forwarding those parameters as received to a third-party web service if the web service is a third-party web service. Dr. Arner will testify that SOAP messages received by the intermediary server that were typically passed back to remote devices were received by the intermediary to ensure that only authorized users on authorized client devices could access the functionality provided by a given application. Dr. Arner will testify that this design helped meet the goal of better security and better context-accuracy.

61. Dr. Arner will testify that he was motivated to use “Global Unique Identifiers”

(GUIDs) instead of the URLs in the application to specify the web service address to provide additional security benefits. Additionally, Dr. Arner will testify that he wanted to associate the web service address with a unique GUID so that different functionalities could have the same name for different web services, but the correct web service could be identified by its GUID.

62. Dr. Arner will testify that in Arner, the URL is replaced with a GUID in the application when the application is published to the server. Dr. Arner will also testify that when the mobile device sends a request for web services to the intermediary server, the GUID is converted back into a URL by the intermediary server, and then the intermediary server forwards the request on to the web service.

63. Dr. Arner will testify that without the access control provided by the intermediary server, all users would have equal access to all web services. Dr. Arner will testify that he viewed unmediated access as undesirable for business uses as it would allow for unrestricted public information portals.

64. Dr. Arner will testify that he made certain design choices in Arner. He will testify that in addition to a GUID, in Arner the request from the mobile device for web services includes specific parameters expected by the web service. Dr. Arner will explain that the GUID is separate from these parameters and identifies the specific web service being requested. Dr. Arner will testify that web service parameters are the parameters expected by the web service (based on the definitions in the WSDL file for that web service). Dr. Arner will testify that these parameters are sent from the mobile device to the web service (through the intermediary server) and are not modified by the intermediary server or any other server along the way.

65. Dr. Arner will also testify that to access web services from a client device using the functionality and tools described in Arner, the application player would send a GUID as well

as relevant parameters to the intermediary server, the intermediary server would use the GUID to ensure the application player was authorized to access to the requested web service, and if so, the intermediary server would pass the parameters received from the device on to the requested web service.

66. Dr. Arner will further testify that the web service then provides a response to the intermediary server, which includes response parameters, and this response is sent by the intermediary server to the application player on the mobile device. After the application player receives this response, it interprets the response, including the parameters, and displays any information on the screen of the mobile device. Dr. Arner will testify that this design ensured that only application players authorized to access a given web service would be given access, and only application players authorized to receive information would be passed that information.

**V. DR. ARNER'S TESTIMONY ABOUT WHAT FUNCTIONALITY HE CONSIDERED IMPORTANT AND USEFUL**

67. Dr. Almeroth, Express Mobile's expert, opines that "the creators of Arner did not consider or believe [certain] functionality was necessary." Almeroth Reb. Rpt. ¶ 900 (Oct. 7, 2020). Dr. Arner will testify as to what functionality he considered or believed to be necessary, and where that is reflected in Arner. Specifically, Dr. Arner will testify that he believed storing applications and their associated settings, including information about application components and other information, in a database was considered useful and is disclosed in Arner.

Dated: April 29, 2022

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